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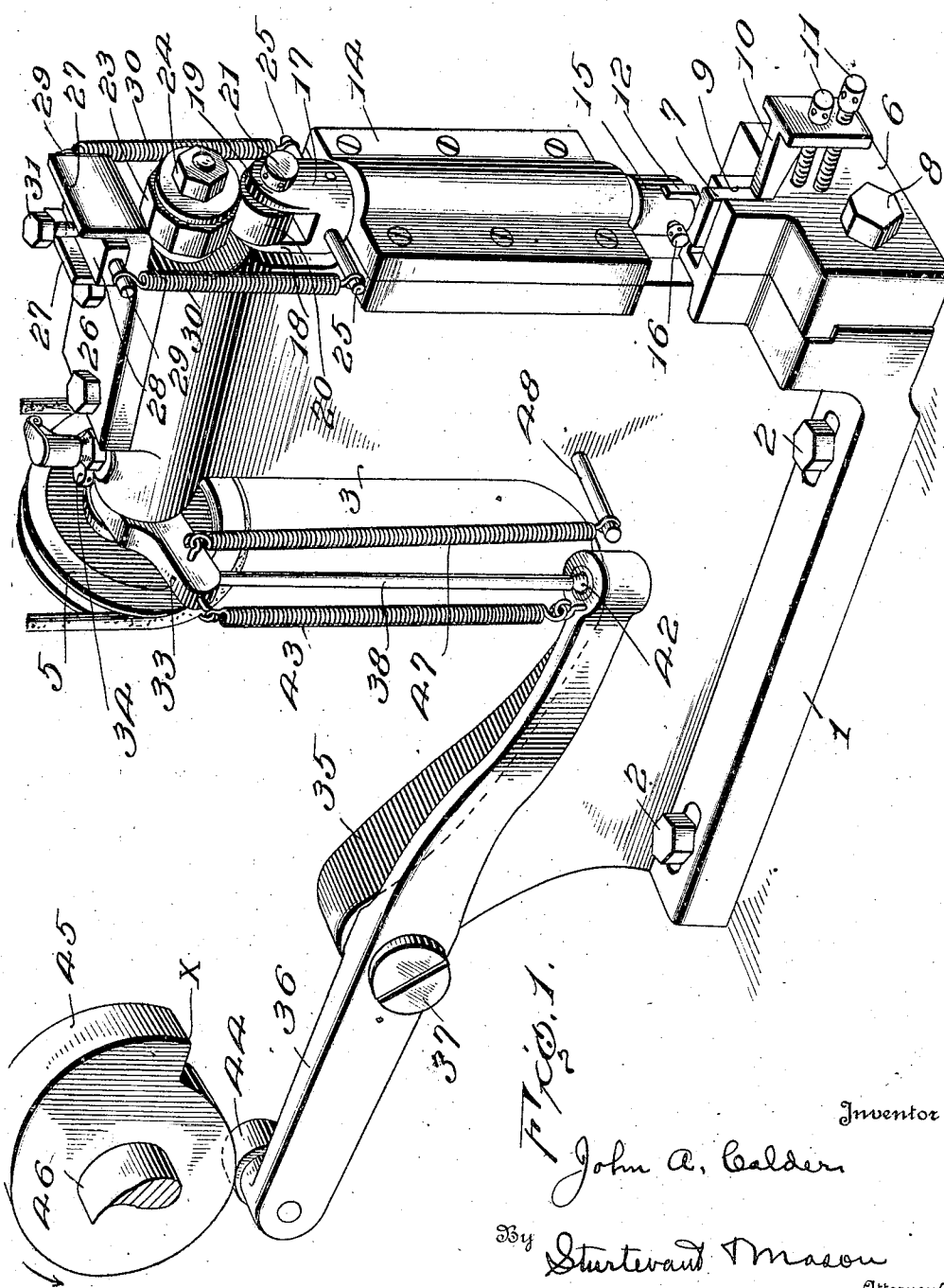
J. A. CALDER

1,483,071

RIVETING MACHINE

Filed June 15, 1921

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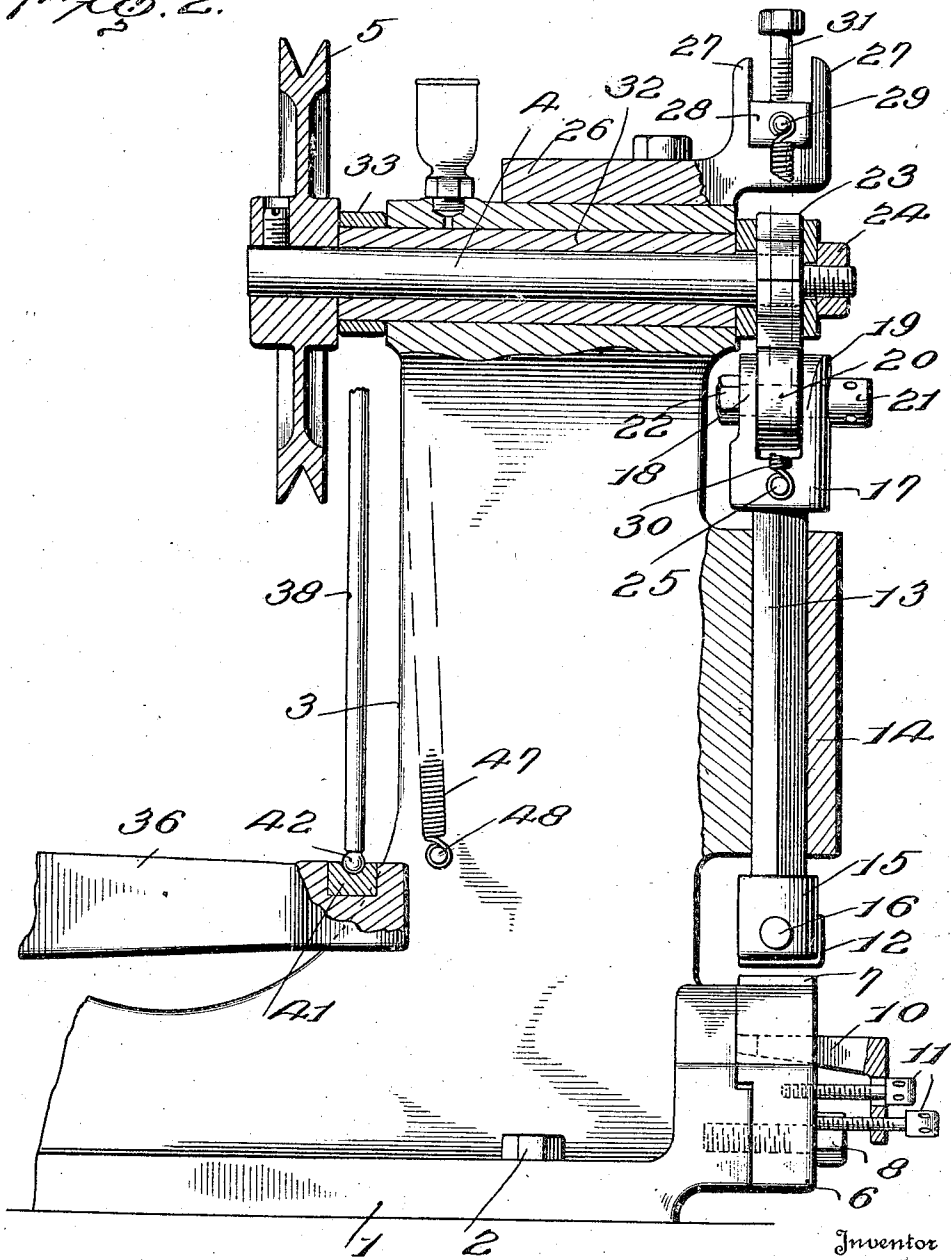
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Fig. 2.



John A. Calder

By Stewart Mason

Attorneys

Feb. 12 , 1924.

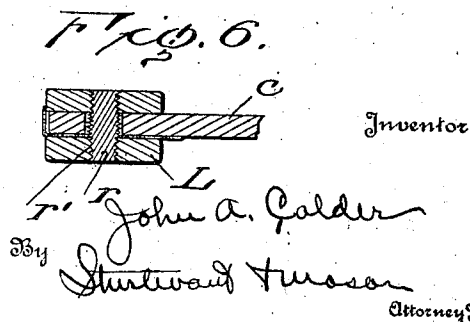
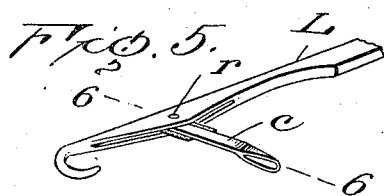
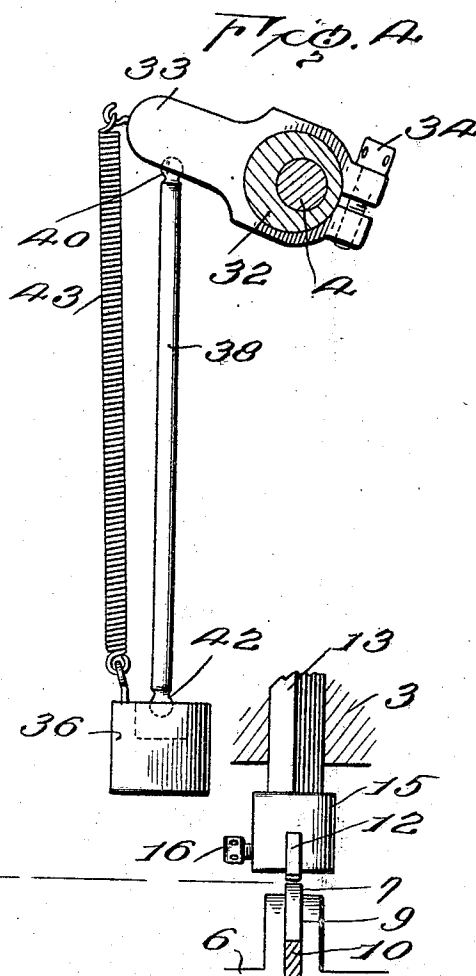
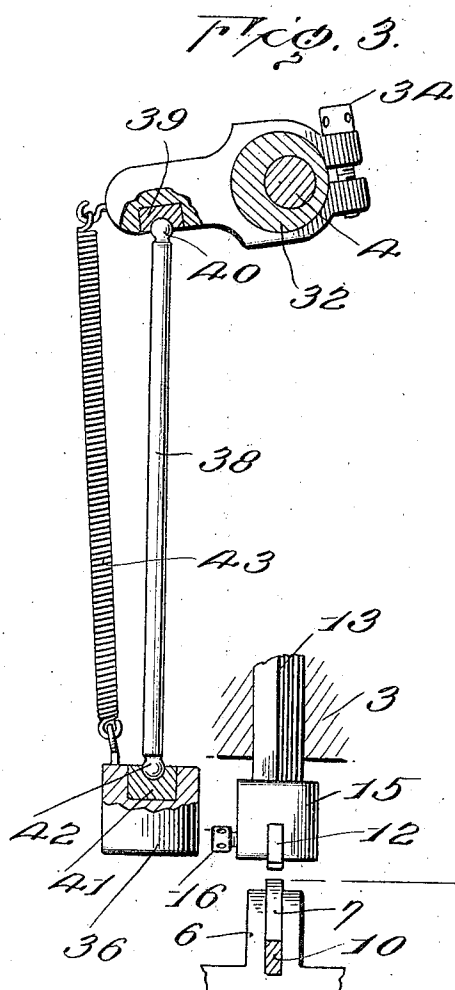
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE.

JOHN A. CALDER, OF TORRINGTON, CONNECTICUT, ASSIGNOR TO THE TORRINGTON COMPANY, OF TORRINGTON, CONNECTICUT, A CORPORATION OF CONNECTICUT.

RIVETING MACHINE.

Application filed June 15, 1921. Serial No. 477,708.

To all whom it may concern:

Be it known that I, JOHN A. CALDER, a citizen of the United States, residing at Torrington, in the county of Litchfield, State of Connecticut, have invented certain new and useful Improvements in Riveting Machines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in riveting machines, and more particularly to a riveting machine which is adapted to head the rivet by a series of light blows.

An object of the invention is to provide a machine of the above type wherein the working position of the riveting hammer is shifted during the riveting operation by a bodily shifting of the actuating member therefor toward and from the article being riveted.

A further object of the invention is to provide a riveting machine of the above type wherein the riveting hammer is actuated by the rotating shaft carrying the operating member shaped so as to impart a plurality of reciprocations to said riveting hammer during each rotation of said shaft, and wherein said shaft is so mounted that it may be moved bodily toward and from the article being riveted for varying the working position of the riveting hammer during the riveting operation.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention:—

Figure 1 is a perspective view of a riveting machine embodying the improvements;

Fig. 2 is a view partly in side elevation and partly in vertical section on the line of the operating shaft;

Fig. 3 is a view partly in transverse section and showing the general arrangement of the parts at the time when the riveting operation is about to begin;

Fig. 4 is a similar view but showing the position of the parts at the completion of the riveting operation;

Fig. 5 is a perspective view of a latch knitting needle which has been riveted on the machine, and

Fig. 6 is an enlarged sectional view on the line 6—6 of Figure 5.

In carrying out the invention, I have provided a riveting machine which consists of a supporting framework carrying an anvil on which the article to be riveted is placed. Directly above the anvil is a riveting hammer, and this riveting hammer is given rapid reciprocations by means of a rotating shaft carrying an operating member which is preferably so constructed as to impart a series of reciprocations to the hammer upon each rotation of the shaft. The riveting hammer is held yieldingly in contact with the rotating operating device. The shaft carrying the rotating device is mounted in an eccentric sleeve, and this eccentric sleeve is capable of being oscillated for moving the shaft bodily toward and from the base of the machine, and this in turn moves the actuating member bodily toward and from the anvil and thus during the reciprocations of the hammer, causes the working position to gradually shift toward and from the article being riveted. By this arrangement, a series of very light blows may be imparted to the rivet, and as the rivet shortens through the riveting down of its head or heads, the hammer follows up the rivet until the riveted operation is completed.

Referring more in detail to the drawings, the improved riveting machine consists of a supporting base 1 which is secured to the bench or table by means of screws 2, 2 passing through elongated slots in the base 1. Said base carries an upright standard 3 in which is mounted a rotating shaft 4. Said shaft 4 is rotated by a suitable belt wheel 5.

Mounted on the base 1 is a bracket 6 which is adapted to support an anvil 7 on which the article to be riveted is placed. The bracket 6 is secured to the base 1 by means of bolts 8. Said bracket is formed with a slot 9 in which the anvil is placed, and the anvil rests on the wedge-shaped support 10. This wedge-shaped support 10 is capable of being moved in or out by means of screws 11 and held in any set position. By adjusting this wedge-shaped support 10, the anvil may be raised or lowered as desired.

The article to be riveted, as above noted, is placed on the anvil, and the rivet is upset by means of a riveting hammer 12. This riveting hammer 12 is secured at the lower end by a reciprocating bar 13. Said bar 13

is mounted to reciprocate vertically in a suitable guiding recess formed in part in the standard 3 and in part in a cover plate 14. At the lower end of the reciprocating bar 13 there is a slotted head 15 in which the hammer 12 is secured by means of a set screw 16. At the upper end of the reciprocating bar 13 there is a head 17 which is rigidly secured to the bar 13. This head is provided with upwardly projecting arms 18 and 19, and between said arms there is a roller 20. Said roller is mounted on a bolt 21 which is held on the arms 18 and 19 by a nut 22. On the extreme right-hand end of the shaft 4 there is an actuating device 23 which as shown in the drawings, is provided with eight flat sides. Said actuating device is rigidly clamped on the shaft 4 by means of a nut 24.

Extending laterally from the head 17 are arms 25, 25. Mounted on the upper end of the standard 3 is a bracket 26. Said bracket is provided with spaced upwardly extending arms 27, 27 between which is placed a bar 28, which bar in turn is provided with the laterally projecting arms 29, 29. Springs 30, 30 connect the arms 25 and 29, respectively. These springs normally exert a yielding lifting action on the arms 25, 25 and thus raise the roller 20 and hold the same in yielding contact with the actuating device 23. A threaded bolt 31 passes through the bar 28 and bears against the bracket, and serves as a means for raising the bar 28 to increase the tension on the springs 30, 30.

From the above it will be apparent that as the shaft 4 rotates, the hammer 12 will have imparted thereto eight reciprocations for one rotation of the shaft. Said hammer will be forced downwardly positively and lifted by means of springs 30, 30.

The shaft 4 is mounted in an eccentric sleeve 32. Said eccentric sleeve is in turn mounted in a suitable bearing on the standard 3. This eccentric sleeve projects to the left of the standard as viewed in Fig. 2, and the arm 33 is clamped on the eccentric sleeve by means of a clamping screw 34. The standard 3 is provided with a rearward extension 35 and a lever 36 is pivoted at 37 to said extension 35. Said lever is connected to the arm 33 by means of a link 38. There is a recess formed in the lower face of the arm 33 in which is placed a hardened block 39, and the link 38 has a ball head 40 engaging a semi-spherical recess in this hardened block 39. There is also a hardened block 41 set in the end of the lever 36 which is provided with a semi-spherical recess adapted to receive a ball 42 on the lower end of the link 38. A spring 43 connects the arm 33 and the lever 36 and holds the balls on the ends of the link in their respective sockets in the hard-

ened blocks. Through this connection, the movement of the lever 36 in an upward direction will be positively imparted to the arm 33 and thus the eccentric sleeve positively turned in a clockwise direction as viewed in Figures 3 and 4. At the rear end of the lever 36 there is a roller 44 which bears on a cam 45 carried by the operating shaft 46. This cam 45 is so shaped as to gradually depress the rear end of the lever 36 and when the point x is reached, then the lever 36 is quickly released so that it may return to its normal position for the beginning of the next riveting operation. A spring 47 is connected to the lever 33 at its upper end and to a pin 48 carried by the standard 3 at its lower end. This spring normally tends to hold the roller 44 in contact with the cam 45 and operates to depress the outer end of the arm 33 when the roller passes the point x on the cam.

In Figures 5 and 6 I have shown a latch needle L which is provided with a latch L , and this latch is riveted to the body portion of the needle by a rivet r . The rivet r is preferably provided with threads r' and both ends of the rivet are upset and the central portion of the rivet slightly enlarged during the riveting operation.

It is essential that the heads of the rivet shall be well seated in the recesses in the cheeks of the body portion of the needle, and this is best accomplished by a series of light blows which follow up the rivet as it shortens. The machine described above is particularly adapted for this purpose, although it may be equally used in connection with the heading of any small rivet.

In the operation of the machine, the latch needle is placed between the hammer and the anvil, with one head of the rivet resting on the anvil and the other head in range of the hammer. As the shaft 4 rotates, the riveting hammer will be given very rapid vibrations,—eight reciprocations for each rotation of the shaft. When the article is placed, then the shaft 46 which is in continuous operation will cause the lever 36 to be depressed at its upper end, raised at its inner end, and the raising of the lever at the inner end raises the outer end of the arm 33 and this turns the eccentric sleeve so as to bodily lower the shaft 4, and the actuating device 23 carried thereby. As the actuating device is lowered, the reciprocating bar 13 shifts its working position and the hammer comes down into range of the rivet, makes contact therewith, gradually shortens the rivet as it is headed, following up the rivet as it shortens through the continued gradual oscillation of the eccentric sleeve. At the finish of the riveting operation, the cam 45 is turned to a position so that the point x is reached by the roller 44, and

the roller 44 passing off from this point
 a is released from the cam, so that the
 spring 47 may quickly depress the upper
 end of the arm 33 and thus raise the rivet-
 ing hammer from contact with the article.

It is obvious that minor changes in the
 details of construction may be made with-
 out departing from the spirit of the in-
 vention as set forth in the appended claims.

Having thus described the invention,
 what I claim as new and desire to secure by
 Letters Patent, is:—

1. A riveting machine including in com-
 bination, a riveting hammer, a rotating
 shaft, a reciprocating member carrying said
 hammer, an actuating member carried by
 the shaft for moving said reciprocating
 member, means for yieldingly holding said
 reciprocating member in contact with the
 actuating member on the shaft, and means
 for shifting the actuating shaft toward and
 from the article being riveted for varying
 the reciprocating position of the riveting
 hammer.

2. A riveting machine including in combi-
 nation, a riveting hammer, a rotating shaft,
 an actuating member carried by said shaft
 having a plurality of flat sides, a reciprocating
 member carrying said hammer, and
 means for yieldingly holding the reciprocating
 member in contact with the actuating
 member on the shaft, and means for bodily
 shifting the actuating shaft toward and
 from the article being riveted.

3. A riveting machine including in combi-
 nation, a riveting hammer, a rotating
 shaft, an actuating member carried by said
 shaft having a plurality of flat sides, a reciprocating
 member carrying said hammer,
 means for yieldingly holding the reciprocating
 member in contact with the actuating
 member on the shaft, a sleeve in which said
 shaft is eccentrically mounted, and means
 for oscillating said sleeve for moving the
 shaft toward and from the article being
 riveted.

4. A riveting machine including in combi-
 nation, a riveting hammer, a rotating shaft,
 an actuating member carried by said shaft
 having a plurality of flat sides, a reciprocating
 member carrying said hammer, means
 for yieldingly holding the reciprocating
 member in contact with the actuating mem-
 ber on the shaft, and positive means for
 moving said sleeve for shifting the shaft
 gradually toward the article being riveted
 during the riveting operation.

5. A riveting machine including in com-
 bination, a riveting hammer, a rotating

shaft, an actuating member carried by said
 shaft having a plurality of flat sides, a re-
 ciprocating member carrying said hammer,
 means for yieldingly holding the reciprocating
 member in contact with the actuating
 member on the shaft, positive means for
 moving said sleeve for shifting the shaft
 gradually toward the article being riveted
 during the riveting operation, and yielding
 means for quickly lifting the shaft to its
 extreme raised position after the riveting
 operation is completed.

6. A riveting machine including in com-
 bination, a supporting base, a standard, a
 reciprocating bar mounted on said standard,
 a hammer carried at the lower end of said
 bar, an anvil carried by the base, a rotating
 shaft mounted on said standard, a flat sided
 actuating member fixed to said shaft, a roller
 carried by said reciprocating bar, springs
 for raising the reciprocating bar to hold the
 roller in contact with the actuating member
 on the shaft, and means for bodily raising
 and lowering the shaft for moving the rivet-
 ing hammer toward and from the anvil.

7. A riveting machine including in com-
 bination, a supporting base, a standard, a
 reciprocating bar mounted on said standard,
 a hammer carried at the lower end of said
 bar, an anvil carried by the base, a rotating
 shaft mounted on said standard, a flat sided
 actuating member fixed to said shaft, a roller
 carried by said reciprocating bar, springs
 for raising the reciprocating bar to hold the
 roller in contact with the actuating member
 on the shaft, a sleeve in which said shaft is
 eccentrically mounted, an arm attached to
 the sleeve, a lever connected to said arm for
 moving the arm positively to lower the shaft
 during the reciprocations of the hammer,
 and a cam for engaging and actuating said
 lever.

8. A riveting machine including in com-
 bination, a standard, a reciprocating bar
 carried by the standard, a hammer mounted
 at the lower end of said bar, an anvil be-
 neath said hammer, a rotating shaft mount-
 ed in said standard, an actuating member
 carried by the shaft and having a series of
 flat sides, means carried by said bar adapt-
 ed to engage said member, springs connected
 to the reciprocating bar for yieldingly hold-
 ing the means carried thereby in engage-
 ment with the actuating member, and means
 for varying the tension of said springs.

In testimony whereof, I affix my signa-
 ture.

JOHN A. CALDER.